

Northern Ireland Surgical Registrars' Prize Meeting

The first Northern Ireland Surgical Registrars' Prize Meeting was held in the Royal Victoria Hospital on Friday, 10th November 2000. All Basic and Higher Surgical Trainees within the Northern Ireland Surgical Training Schemes had been invited to submit abstracts for consideration for presentation at the meeting. From a submission of 26 abstracts, ten papers were selected for presentation.

Following the meeting, the John Templeton Prize for the outstanding presentation was awarded to Mr. Kevin McCallion for his paper entitled "Neurosurgical patients admitted to Intensive Care Units exhibit a systemic inflammatory response which is distinct from the mixed antagonist response syndrome exhibited by emergency surgical/trauma patients". Two additional prizes, the Ethicon and the Janssen Cilag awards, were given to Miss Jan Bingham and Mr. Robert Kennedy for their respective papers.

The following ten abstracts were presented at the meeting:

AN EVALUATION OF SERIAL MEASUREMENTS OF CEA AND CA 15-3 IN THE DETECTION OF PRE-CLINICAL RECURRENCE IN BREAST CANCER

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INTRODUCTION

An elevation in the level of tumour markers, CEA and CA 15-3, in blood has been positively correlated with the clinical stage of breast cancer. However, their use in the monitoring of disease recurrence remains unclear in the clinical setting. Combining the use of CEA and CA 15-3 has been reported to have a 64%-94% sensitivity for detecting disease recurrence, and a normal level suggests an absence of metastatic disease. However the specificity of these human markers and the senior level above which they are indicative of disease recurrence remains to be elucidated.

AIM

We aim to determine the sensitivity and specificity, and the role of serial measurements of CEA and CA 15-3 in the detection of early recurrences in breast cancer, prior to the development of clinical signs or symptoms.

METHODS

Sequential measurements of CEA and CA 15-3 were performed in the follow-up blood samples of 115 breast cancer patients who presented between 1995 to 2000, after treatment for their primary disease. The levels of these tumour markers were correlated with the clinical data. The cut-off values for serum CEA was compared between 2 ng/ml and 4 ng/ml, and for CA 15-3 was at 25 U/ml.

RESULTS

During follow-up, 28 patients (24.3%) developed recurrent disease. The sensitivity of serum CEA for detecting recurrent breast cancer was 37% (10/27), and specificity 83% using a cut off level >4 ng/ml. The sensitivity increased to 66% (18/27) when a CEA cut-off level >2 ng/ml was used, but the specificity dropped to 50%. For CA 15-3, the sensitivity was 57.7% and specificity also 83%. Combining both CEA (cut-off 2 ng/ml and 4 ng/ml) and CA 15-3, the sensitivity was found to be 69.2% and 84.6%, and the specificity 65.9% and 36.4% respectively.

The CEA and CA 15-3 levels were raised in 69.2% (18/26) using CEA >4 ng/ml as cut-off: they were raised in 88.5% (22/26) using CEA >2 ng/ml as cut-off. The time between a rise in the serum level of these tumour markers and the appearance of clinically detectable disease was between 2 to 44 months. Six patients developed symptomatic disease recurrence. They were further investigated radiologically, resulting in the administration of a different adjuvant therapy in 5 patients.

CONCLUSION

Combining the use of 2 tumour markers, CEA and CA 15-3, enabled early detection of breast cancer recurrence prior to the development of clinically apparent disease. A high sensitivity

and specificity was achieved using CEA >4 ng/ml and CA 15-3 >25 U/ml to indicate disease recurrence. We propose that serial measurements of CEA and Ca 15-3 may be incorporated into the routine follow-up assessment of breast cancer patients.

THE USE OF URINARY TNF RECEPTOR CONCENTRATION AS AN INFLAMMATORY MARKER AND DIAGNOSTIC TOOL IN GASTROINTESTINAL DISEASE

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Soluble tumour necrosis factor receptors (TNFr) are released in sepsis. Urinary concentrations of TNFr have been shown to correlate with disease activity in patients with IBD. In this study, urinary concentrations of TNFr were measured along with recognised markers of inflammation in patients with one of four gastrointestinal conditions [colorectal carcinoma, acute diverticulitis, ulcerative colitis (UC) and Crohn's disease (CD)] and in healthy controls. We hypothesised firstly that urinary TNFr concentration would correlate with other markers of inflammation in gastrointestinal disease and secondly that TNFr measurement might be used to differentiate between UC and CD.

METHODS

Forty patients were recruited to the trial. Ten healthy controls were also enrolled. Erythrocyte sedimentation rate (ESR), C-reactive protein and alpha-1 acid glycoprotein were measured using standard laboratory techniques. Urine was also collected for measurement of p75 TNFr concentrations. Spearman's rank coefficients were used to assess correlation. The Mann-Whitney U test compared the ulcerative colitis and Crohn's disease results.

Urinary TNFr concentrations correlated positively with each of the other markers in each condition ($P < 0.001$). There was no significant difference between TNFr concentrations in UC and CD ($P = 0.257$).

The non-invasive measurement of urinary TNFr concentration may, in the future, be a useful, cost-effective marker of inflammation in patients with gastrointestinal inflammation but is unlikely to differentiate between ulcerative colitis and Crohn's disease.

RESULTS ARE EXPRESSED AS MEDIAN (INTER-QUARTILE RANGE)

	n=	ESR (mm/hr)	C-reactive protein (mg/L)	α -1 acid glycoprotein (g/L)	Urinary TNFr (ng/ml)
Colonic carcinoma	10	43(30-98)	48(38-242)	1.9(1.3-2.2)	22.8 (5.1-31.7)
Acute diverticulitis	10	79(46-111)	53(9-79)	2.0(1.1-2.1)	30.8(21.1-60.3)
Ulcerative colitis	10	15(12-26)	3(0-10)	1.0(0.6-1.2)	8.3(4.2-10.6)
Crohn's disease	10	25(16-50)	8(3-28)	1.6(1.2-2.6)	9.9(7.9-12.4)
Controls	10	14(13-19)	0(0-0)	0.5(0.3-0.6)	3.7(3.0-5.2)

NEUROSURGICAL PATIENTS (NSX) ADMITTED TO INTENSIVE CARE UNITS (ICU) EXHIBIT A SYSTEMIC INFLAMMATORY RESPONSE WHICH IS DISTINCT FROM THE MIXED ANTAGONIST RESPONSE SYNDROME (MARS) EXHIBITED BY EMERGENCY SURGICAL/ TRAUMA PATIENTS (TSX)

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INTRODUCTION

It was hypothesised that NSx patients requiring ICU admission would exhibit evidence of a systemic inflammatory response, explaining their risk of multi-organ dysfunction.

METHOD

NSx (elective and emergency, n=15) and TSx (n=10) patients admitted to a regional ICU had blood taken on the 3rd day of admission. Blood was also taken from controls (n=24). Maximal neutrophil (PMN) respiratory burst activity was assayed over 17.3 mins using a BioOrbit 1251 Luminometer to detect whole blood chemiluminescence in the presence of luminol, phorbol 1,2- myristate 1,3-acetate and tumour necrosis factor. The peak signal was obtained and divided by the white cell count ($\times 10^{-7}$ mV/white cell). Soluble p55 TNF receptor (anti-inflammatory marker) and interleukin 6 (IL6, pro-inflammatory marker) were measured by ELISA and bioassay respectively.

RESULTS (MEDIAN [Q1,Q3])

TSx patients exhibited a MARS on day 3, with elevated IL6 (547 [232, 720] pg/ml vs undetectable levels in controls, $p < 0.001$), elevated p55TNF (22 [15, 36] ng/ml vs 8 [5, 13] ng/ml in controls, $p = 0.007$) and elevated PMN activity (61 [26, 94] vs 14 [11, 19] in controls, $p = 0.001$). NSx patients exhibited a different inflammatory pattern, with

elevated IL6 (217 [48, 280] pg/ml vs undetectable levels in controls, $p=0.030$), no rise in p55TNF (9 [7, 13] ng/ml vs 8 [5, 13] ng/ml in controls, $p=0.662$) and a non-significant elevation in PMN activity (30 [7, 79] vs 14 [11, 19] in controls, $p=0.107$).

DISCUSSION

The concept of a balance between pro- and anti-inflammatory mediators is attractive, explaining why measurements of a single mediator may be misleading. As PMN are subject to stimulation by many such mediators, assays of respiratory burst activity may be useful in determining the status of such a balance.

CONCLUSION

Patients admitted to ICU with neurosurgical insults exhibit a systemic inflammatory response which is distinct from that exhibited by emergency surgical/trauma patients.

EUROPEAN QUESTIONNAIRE SURVEY OF SURGICAL STRATEGIES FOR THE MANAGEMENT OF SEVERE ACUTE PANCREATITIS.

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OBJECTIVES

Although contemporary guidelines provide a framework for the initial management of severe acute pancreatitis, there remains no consensus opinion regarding the optimal surgical strategies for local complications. The objective of this study was to survey surgeons in hepatobiliary units across Europe to establish an overview of the current surgical management of severe acute pancreatitis.

METHODS

A mailshot questionnaire survey was sent to 866 members of the European Chapter of the International Hepatobiliary Association (IHPBA). A total of 331 questionnaires were returned, but only 327 (38%) were suitable for analysis (4 clinicians retired).

RESULTS

The most common (127 [38.8%]) number of patients with severe acute pancreatitis treated per

year was 11 to 20. The commonest severity stratification system used was Ranson's criteria (168 [51.4%]). CRP was used as a serum marker of disease severity by 149 (45%) respondents, however 180 [55%] respondents used clinical assessment also. Prophylactic antibiotic therapy in severe acute pancreatitis was used by 229 (70%) of respondents, the commonest antibiotics used being third generation cephalosporins and imipenem. The majority of respondents (210 [64.2%]) used an early (within 72 hours) CT with 284 (86.9%) using intravenous contrast. 168 (51.4%) respondents use FNA of pancreatic necrosis for the diagnosis of local infection, with 99 (30.3%) of these stating they would always operate on a positive FNA. There was no general consensus as to the optimal timing of surgical intervention. The commonest procedure carried out for pancreatic abscess was percutaneous drainage (154 [47.1%]). The commonest procedure performed for pancreatic necrosis was surgical drainage, followed by closed irrigation (142 [43.4%]), then staged surgical resection (necrosectomy with skin closure and planned re-operation) in 94 (28.7%) respondents.

CONCLUSIONS

This study highlights the widely disparate protocols currently employed in the management of severe acute pancreatitis, advocating the implementation of standardised guidelines to encourage more consistency in the management of severe acute pancreatitis.

CIRCULATING LEVELS OF VASCULAR ENDOTHELIAL GROWTH FACTOR FOLLOWING OESOPHAGEAL CANCER RESECTION – RELATIONSHIP TO PLATELET COUNT

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BACKGROUND

It has been proposed that serum (S-VEGF) or plasma (P-VEGF) Vascular Endothelial Growth Factor levels may have prognostic significance in patients following cancer resection. However the

potential confounding effect of surgical trauma is unknown. The aim of this study was to investigate the degree and duration of alteration in circulating VEGF concentration and platelet count following oesophageal cancer resection.

METHODS

S-VEGF, P-VEGF and platelet counts were measured in 23 patients undergoing oesophageal cancer resection. Samples were taken preoperatively and at 6 weeks following surgery. Seven patients were also sampled on postoperative days 1, 5 and 10. VEGF levels were assayed using an Enzyme Linked Immunosorbent Assay (ELISA) kit specific for Human VEGF (Quantikine human VEGF, R&D Systems, Minneapolis, Minnesota.).

RESULTS

Circulating levels of VEGF were elevated postoperatively. However by 6 weeks S-VEGF had fallen to baseline but P-VEGF remained elevated ($p < 0.05$, Wilcoxon Signed Ranks). Platelet counts mirrored changes in circulating VEGF levels, correlating closely with S-VEGF ($\rho = 0.281$; $p < 0.05$, Spearman's Rank) and P-VEGF ($\rho = 0.330$; $p < 0.01$, Spearman's Rank).

CONCLUSIONS

Surgery causes comparable elevations in platelet count and circulating VEGF postoperatively. S-VEGF and P-VEGF are closely associated with platelet count. The prognostic significance of circulating VEGF independent of platelet count remains to be confirmed.

RECURRENT SYMPTOMS AND FAECAL INCONTINENCE FOLLOWING HAEMORRHOIDECTOMY

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INTRODUCTION

Haemorrhoidectomy has been the gold standard for the treatment of significant haemorrhoids for many years. However the long-term outcome and the incidence of faecal incontinence following surgery is largely unquantified.

METHODS

The case notes of all patients who underwent a haemorrhoidectomy from January 1988 to January 1999 were reviewed. Demographic and operative data were retrieved. All patients were sent a

postal questionnaire concerning recurrent symptoms, faecal incontinence, GP attendance and overall satisfaction.

RESULTS

164 patients (81 male; 83 female) received a questionnaire of which 120 (73.2%) responded. Three patients were deceased, 1 had a permanent ileostomy, and 40 were lost to follow up. The majority had elective surgery ($n = 112$). The median age at the time of surgery was 53 years (44-63) years and the median follow-up was 70 months (45-95).

Chart review suggested that 92 (76.5%) patients had not incurred a complication. Only 5 (4.2%) patients were recorded as having any degree of faecal incontinence post-operatively. Questionnaire results showed that 44 (36.7%) patients were symptom free whereas 28 (23.3%) patients had symptoms more than once/week. Twenty eight (23.3%) patients had consulted their GP and 30 (25%) had used further treatment. Bleeding was better controlled than itch/discomfort (no bleeding = 73; no itch/discomfort = 59). Only 45 (37.5%) patients were completely continent with 9 (7.5%) patients complaining of incontinence of solids, liquids, and gas more than once/week. A significantly higher proportion of patients who had undergone anal stretch at the time of surgery ($n = 29$) experienced incontinence compared with those who did not have this additional procedure (69% vs 61%; $p = 0.05$)*. Overall patient satisfaction was high with 91 (75.8%) grading their outcome as excellent or good.

CONCLUSIONS

Although surgery is considered as the definitive treatment for haemorrhoids, a significant number of patients have recurrent symptoms or faecal incontinence, which they may not report. Anal stretch at the time of surgery results in a higher incidence of faecal incontinence.

* Fisher's exact

CAN POOR OUTCOME AFTER CARDIAC SURGERY BE PREDICTED?

Quality of life and survival in patients after a long stay in cardiac surgical ICU following cardiac surgery

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Long stay in the ICU following cardiac surgery has major implications regarding manpower and resource utilisation. Majority of cardiac surgical procedures have a low risk with high probability of relief of symptoms and improved expectation of quality of life. A predictive model that identified patients who are certain to die would spare suffering and free resources. The aim of this study was to check the accuracy of the current risk scoring algorithms available to the clinician in predicting- poor outcome after cardiac surgery.

In the calendar year 1998, 1,006 adult patients underwent cardiac surgical procedures, only 34 (3.37%) spent more than 96 hours in the cardiac surgical ICU, the average length of stay excluding the long stay patients was 24 hours. Patients who had a protracted stay the mean was 631 hours (26 days), range (96-2,158 hours). Data was collected on these 34 long stay patients retrospectively and preoperative estimation of Parsonnet and Euroscore was done, postoperative estimation of APACHE II score and mortality prediction was performed. In hospital mortality in this group was 26.47% (9 deaths). At the end of one and half years there were 23 survivors, (11 deaths), telephonic administration of quality of life Short Form (SF 36v2™) questionnaire was done, 20 patients answered the questionnaire, two patients could not be traced while one refused to answer.

The sensitivity and specificity was calculated for the preoperative risk scores and postoperative APACHE II score for mortality prediction. Parsonnet score had (sensitivity=0.20, specificity=0.95, overall accuracy=0.72), Euroscore (sensitivity=0.45, specificity=0.91, overall accuracy=0.76), APACHE II score at 32 hours post op (sensitivity=0.82, specificity=0.76, overall accuracy=0.78), the predicted death rate calculated from APACHE II score (sensitivity=0.82, specificity=0.83, overall accuracy=0.82). Quality of life was severely affected with physical status score of 39.08 (range 22.21-57.09), however the average mental status score of 50.034 (range 22.75-63.31) represented only mild affection. The maximum number of potential ICU beds that could be freed was 61 days (16.71%).

Poor outcome after cardiac surgery can be predicted. The existing preoperative risk scores work well for the low risk patients but their accuracy is less in high risk patients. APACHE II score is designed for the noncardiac surgical

patients, but it works well in high-risk cardiac surgical patients. The quality of life is significantly affected in the long stay patients after cardiac surgery. An improved risk algorithm needs to be developed which takes in to account the preoperative, intra operative and post operative factors in determining the morbidity and mortality after cardiac surgery.

BILIARY SYSTEM COMPLICATIONS FOLLOWING LAPAROSCOPIC CHOLECYSTECTOMY – IMPROVED OUTCOME WITH EARLY REFERRAL

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Laparoscopic cholecystectomy is now widely accepted as the 'gold standard' for treatment of symptomatic gallstones, however concerns remain about the incidence of bile duct injury. We review a series of patients referred to a hepatobiliary unit with biliary complications following laparoscopic cholecystectomy.

32 patients were referred over a 7-year period with complications following laparoscopic cholecystectomy, 5 male and 27 female with a median age of 58. Injuries were categorised according to Strasberg's classification.¹

7 patients were referred immediately, 19 early (within 6 weeks) and 6 late (after 6 weeks). 12 patients sustained 'minor' bile duct injury (types A, B and C), 19 receiving more major type D and E injuries. 87% of patients required surgical intervention for definitive management. There were 2 deaths and 28 of the remaining 30 patients have normal liver function tests at follow-up.

STRASBERG CLASSIFICATION OF BILIARY INJURIES

Type	Description	No. Patients
A	Injury to bile duct (in continuity with CBD)	8
B	Partial occlusion of biliary tree	1
C	Injury to bile duct (not in continuity with CBD)	3
D	Laceration to extra-hepatic biliary tree	9
E2	Occlusion of biliary tree < 2 cm from confluence	10

A successful outcome can be obtained for the majority of patients who sustain biliary injuries if they are promptly referred to a specialist centre. Late referral and previous inappropriate attempts at management can be fatal.

LAPAROSCOPY IN THE STAGING OF UPPER GASTROINTESTINAL MALIGNANCY

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BACKGROUND

Optimal management of cancer of the upper gastrointestinal tract requires accurate pre-operative staging to facilitate multimodality therapy planning and to identify those who would benefit from potentially curative surgery. Studies have suggested that staging laparoscopy is a useful adjunct in this process, reducing the number of unnecessary laparotomies in patients with advanced disease. The aim of this retrospective study was to compare staging laparoscopy with CT scanning in the preoperative staging of patients with upper gastrointestinal malignancy in the Royal Victoria Hospital over the last 2 years.

METHODS

Since 1998 laparoscopy has been used in combination with CT scanning in the staging of patients with upper gastrointestinal malignancy in this hospital. The medical charts of 49 patients in which staging laparoscopy was performed were reviewed retrospectively.

RESULTS

Over the study period staging laparoscopy was performed in 33 patients with gastric carcinoma, 10 with pancreatic/periampullary carcinoma, 3 with carcinoid, 1 with a gastrinoma and 2 with benign disease. Compared with CT scanning, laparoscopy confirmed ascites in 11 patients compared to 4. Five patients had peritoneal involvement that was not identified on CT. Furthermore; CT scanning suggested liver metastases in 2 patients that were not confirmed by laparoscopy. In addition laparoscopy identified a further 2 cases of liver metastases, which the CT scan had not picked up. There was no difference in the observation of lymphadenopathy or mass detection using the two modalities. Cytology of peritoneal washings at laparoscopy

confirmed malignancy in 6 patients who had features of advanced disease.

CONCLUSIONS

This small study has demonstrated staging laparoscopy to be an important adjunct in the staging of upper gastrointestinal malignancy as it identified advanced disease that CT failed to demonstrate. This reduces the morbidity and mortality in patients who would formerly have had an unnecessary laparotomy. Peritoneal washout cytology does not appear to contribute significantly to the pre-operative staging of these patients.

ISCHAEMIA REPERFUSION INJURY IS EXAGGERATED BY DIABETES

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This study investigates whether diabetes mellitus accentuates hind limb ischaemia reperfusion injury and leads to greater muscle injury.

METHOD

Male Wistar rats rendered diabetic (n=40) following injection of streptozotocin were compared to non-diabetic control rats (n=30). Each group was divided into sham, 4h of hind limb ischaemia, 4h of ischaemia followed by 10 min, 30 min or 60 min of reperfusion. Blood was taken from the inferior vena cava for measurement of plasma concentration of the end product of lipid peroxidation (malondialdehyde (MDA)) and antioxidants vitamins A & E. Transmembrane potential (TMP) of the gastrocnemius muscle of the ischaemic limb was also measured.

RESULTS

Mean (s.e.m.)

	CONTROL				
	sham	ischaemia	10 min rep.	30 min rep.	60 min rep.
MDA (umol/l)	1.4(0.1)	1.1(0.1)	1.6(0.1)*	2.0(0.2)*	1.4(0.1)
Vit.A (umol/l)	1.5(0.1)	1.5(0.1)	1.5	1.4	1.3*
Vit.E (umol/l)	28.0(0.7)	28.0(0.9)	27.4(0.8)	25.4(1.0)	24.9(1.0)*
TMP (mV)	79.0(1.9)	63.0(2.2)	58.2(1.6)	53.5(2.6)	62.2(2.9)

DIABETIC

	<i>sham</i>	<i>ischaemia</i>	<i>10 min rep.</i>	<i>30 min rep.</i>	<i>60 min rep.</i>
MDA	4.6(0.3)†	2.2(0.4)†	3.0(0.3)†	4.3(0.4)†	2.4(0.2)*†
Vit.A	1.0†	0.9†	0.8*†	0.7*†	0.7*†
Vit.E	26.9(0.8)	27.9(0.8)	27.7(1.5)	24.1(1.1)*	21.9(0.9)*
TMP	74.4(3.4)	56.0(2.2)	51.5(0.8)†	46.4(1.4)*	57.3(3.0)

* p < 0.05 vs ischaemia, †p < 0.05 vs control

CONCLUSION

These results indicate that oxidative stress following reperfusion injury is greater in the presence of diabetes mellitus. This may influence the recovery of diabetic patients following lower limb bypass surgery.